LCD Display Operation Manual

Product Name:

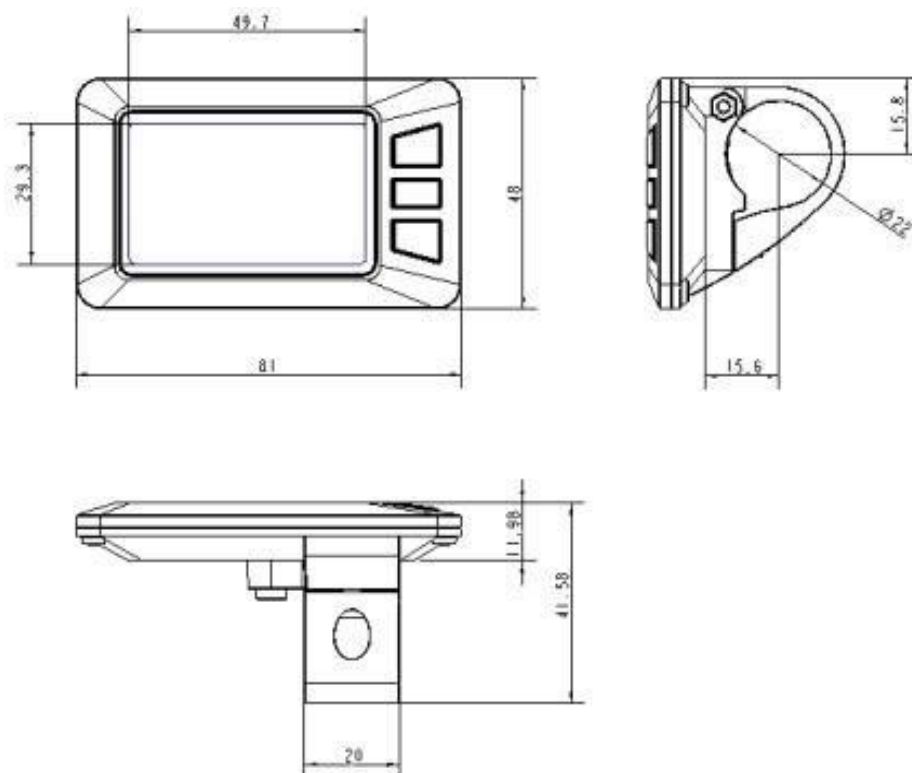Electric Bicycle Intelligent LCD Display

Model:

KD21C

Specifications:

- Power Supply: 24V/36V/48V
- Rated Working Current: 10mA
- Maximum Working Current: 30mA
- Shutdown Leakage Current: <1uA
- Working Current for Controller: 50mA
- Operating Temperature: -20 to 60℃
- Storage Temperature: -30 to 70℃

Appearance size

◆ **Color type**

KD21C lcd display has two sample colors available for the upper case, which are black and white; the lower case color is uniformly black

Overview and Button Definitions:

◆Overview:

The KD21C lcd display panel offers a variety of functions to meet your cycling needs. The features include:

● Intelligent battery level display

● Motor power output indication

● Power assist level adjustment and indication

● Speed display (including real-time speed, maximum speed, average speed)

● Mileage display (including single trip mileage and total mileage)

● Power-assisted pushing control and display

● Ride time display

● Backlight control and display

● Error code display

● Multiple parameter settings (such as wheel diameter, speed limit, battery level setting, power assist parameter setting, power-on password setting, controller current limit setting, etc.)

● Default parameter restoration function

Button Definitions:

The KD21C display panel has three buttons: the power on/off/mode button, the plus button, and the minus button. In the following instructions, the word "**MODE**" is used to represent the Ⓜ button, "**UP**" is used to represent the ➕ button, and "**DOWN**" is used to represent the ➖ button.

**Standard Operations:**

◆**Power On/Off:**

Press and hold the **MODE** button to power on the instrument panel and provide power to the controller. In the power-on state, long-pressing the **MODE** button can turn off the power of the electric vehicle. In the power-off state, the instrument panel does not use the battery power, and the instrument panel's leakage current is less than 1uA.

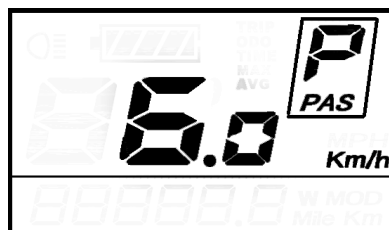▪ If the EV is not used for more than 10 minutes, the meter will automatically shut off.

Display Interface:

After powering on, the instrument panel defaults to displaying real-time speed and total mileage (in kilometers). Pressing the **MODE** button briefly switches the displayed information between real-time speed (kilometers per hour), single trip mileage (kilometers), ride time (hours), maximum speed (kilometers per hour), average speed (kilometers per hour), and motor power output (watts).

◆**Power-Assisted Pushing**
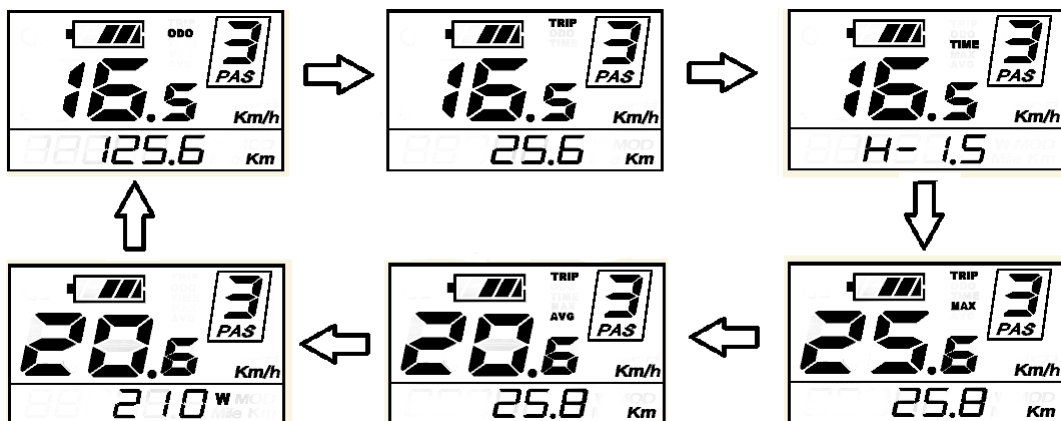
By holding down the **DOWN** button for 2 seconds, the electric vehicle enters the power-assisted pushing state. The electric vehicle travels at a constant speed of 6 kilometers per hour. The screen displays "P". Releasing the **DOWN** button will immediately stop power output and return the electric vehicle to its previous power-assisted pushing state.

■ **The power-assisted pushing function can only be used when the user is pushing the electric vehicle. Please do not use it while riding.**

◆**Turn On/Off Backlight:**

Press and hold the **UP** button for 2 seconds to turn on the backlight of the instrument panel and simultaneously notify the controller to turn on the front light. The LCD backlight can be turned on when there is insufficient external light or during night riding. Press and hold the **UP** button for 2 seconds again to turn off the LCD backlight and notify the controller to turn off the front light.

**Backlight On Display Interface**

Power Assist Level Selection

Pressing the **UP/DOWN** buttons briefly allows you to switch between power assist levels on the electric vehicle, which changes the motor power output. The instrument panel's default power output range is from 0 to 5 levels, with 0 indicating no power output, 1 being the lowest power level, and 5 being the highest power level. When reaching level 5, pressing the **UP** button will still display 5 on the interface, and it will blink to indicate that it is the highest level. After reaching level 0 by decreasing the power assist level, pressing the **DOWN** button will still display 0 on the interface, and it will blink to indicate that it is the lowest level. The instrument panel defaults to level 1 upon startup.

Power Assist Level Selection Display Interface

Battery Level Display

The battery level is displayed in five segments. When the battery voltage is high, all five segments of the LCD are lit. When the battery is low, the outer border of the battery icon blinks at a frequency of 1Hz, indicating the need for immediate charging.
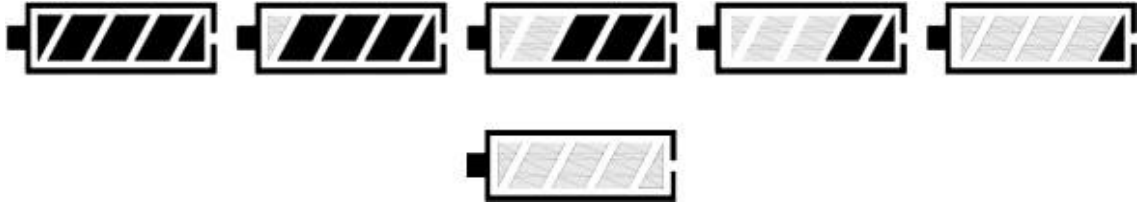
Battery Level Display

◆Error Code Display

When there is a malfunction in the electric vehicle's electronic control system, the instrument panel will automatically display an error code. For detailed definitions of the error codes, please refer to Appendix 1.

Error Code Display Interface

■ **When an error code is displayed, please promptly troubleshoot the issue as the electric vehicle will not operate properly in such cases.**

General Settings

Press and hold the **MODE** button to power on the instrument panel. In the power-on state, when the vehicle is stationary, press and hold the **UP+DOWN** buttons for more than 2 seconds to enter the general settings mode.

■ **All settings should be performed when the vehicle is stationary.**

◆**Reset Single**

Trip MileageTC represents resetting the single trip mileage. Use the UP/DOWN buttons to select Y/N, where Y indicates resetting the single trip mileage and N indicates not resetting the single trip mileage. Press the MODE button briefly to confirm and enter the backlight brightness setting state. Refer to Appendix 4 for symbol definitions.

Single Trip Mileage Reset Operation Interface

Backlight Brightness

bL represents backlight. The parameter can be set as 1, 2, or 3, indicating the backlight brightness level, where 1 is the dimmest, 2 is the standard brightness, and 3 is the brightest. The default value at the factory is 1. Use the **UP/DOWN** buttons to change the backlight brightness parameter. Press the **MODE** button briefly to confirm and enter the English/Metric unit conversion setting state. Press and hold the **MODE** button to confirm and exit the general settings mode.
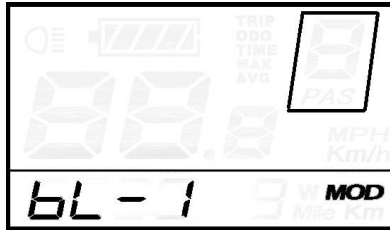
Backlight Brightness Setting Interface

English/Metric Unit Conversion

U represents units, where 1 represents English units and 2 represents metric units. Use the **UP/DOWN** buttons to switch between speed and mileage units. Press the **MODE** button briefly to confirm and return to the single trip mileage reset setting state. Press and hold the **MODE** button to confirm and exit the general settings mode. The default unit on the instrument panel is metric.
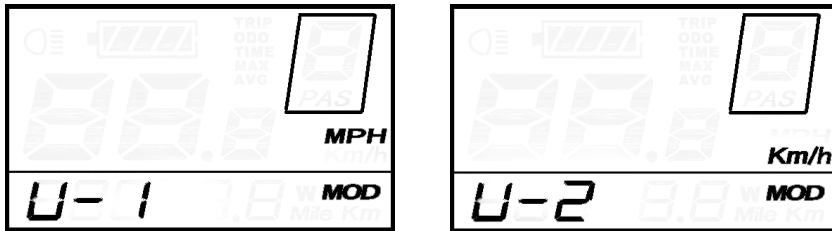
**English/Metric Unit Conversion Setting Interface**

General Parameter Settings

Simultaneously press and hold the **UP+DOWN** buttons for more than 2 seconds to enter the general settings mode. Furthermore, simultaneously press and hold the **DOWN+MODE** buttons for more than 2 seconds to enter the wheel diameter setting interface.

◆Wheel Diameter Setting

LD represents wheel diameter. The available values for selection are: 16, 18, 20, 22, 24, 26, 700C, 28. Use the **UP/DOWN** buttons to choose the appropriate wheel diameter for your vehicle to ensure the accuracy of speed and mileage displayed on the instrument panel. The default wheel diameter value at the factory is 20 inches. Press the **MODE** button briefly to enter the speed limit setting interface.
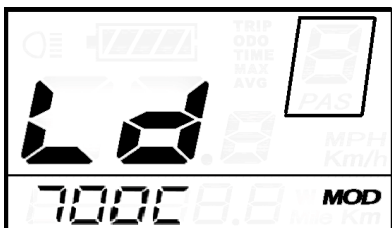
Wheel Diameter Setting Interface

Speed Limit Setting

The default maximum riding speed value at the factory is 25 km/h. You can change this value to set the maximum riding speed of the electric vehicle. When the speed exceeds the set value, the controller will stop supplying power to the motor to ensure the rider's safety. LS represents speed limit. The selectable range for the maximum speed setting is between 12 km/h and 40 km/h. Use the **UP/DOWN** buttons to increase or decrease the setting. Press and hold the **MODE** button to confirm and exit the setting state.
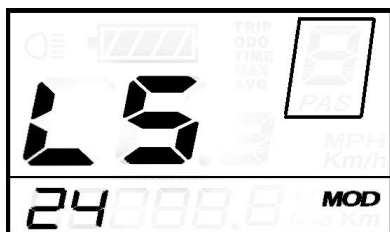
Speed Limit Setting Interface

Personalized Settings

To meet the personalized usage requirements of customers, there are eight personalized settings available, including battery level settings, assist parameter settings, current limit value settings, assist sensor settings, speed sensor settings, handlebar function settings, system settings, and power-on password settings. For detailed settings, please refer to Appendix 2.

Simultaneously press and hold the **UP+DOWN** buttons for more than 2 seconds to enter the general settings mode. Then, simultaneously press and hold the **UP+DOWN** buttons for another 2 seconds to enter the selection interface for personalized settings.

Use the **UP/DOWN** buttons to choose the desired setting item, and press the **MODE** button to enter the corresponding setting interface.

Personalized Settings Selection Interface
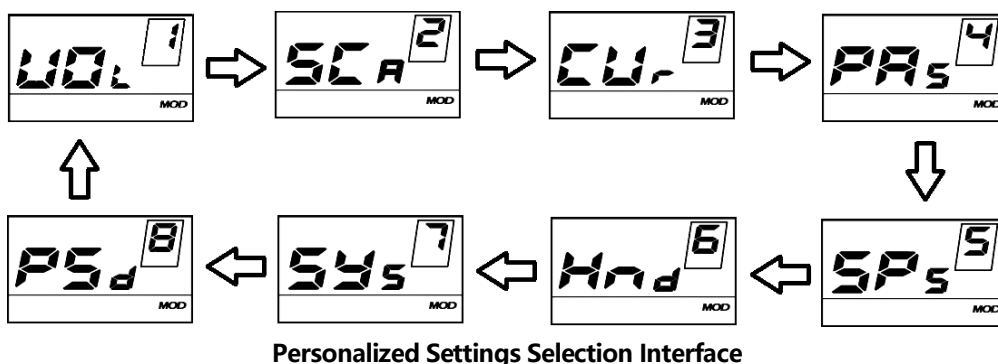
Battery Level Setting

VOL represents voltage. Input voltage values for each of the 5 segments. Taking the first voltage value as an example: "1" on the screen represents the first voltage, and "31.5" represents the corresponding voltage value. Use the **UP/DOWN** buttons to increase/decrease the value, and press the **MODE** button to confirm and enter the next segment of the battery level setting interface. After setting the 5 battery levels, press and hold the **MODE** button to confirm and return to the instrument settings selection interface.
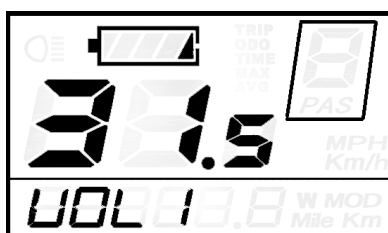
Battery Level Setting Interface

Assist Parameter Setting - Assist Level Selection

In the assist level selection, there are eight modes available: 0-3, 1-3, 0-5, 1-5, 0-7, 1-7, 0-9, 1-9. Use the **UP/DOWN** buttons to switch between the modes. Press the **MODE** button briefly to confirm and enter the corresponding mode's assist ratio value setting interface. The default mode is 0-5.
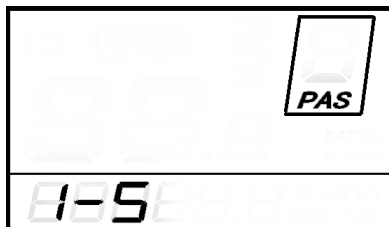
Assist Level Selection Interface
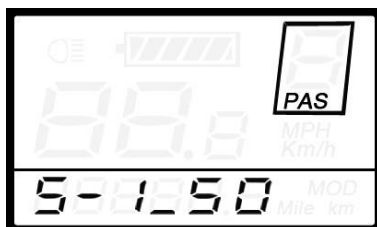
Assist Ratio Value Setting

By adjusting the assist ratio value, you can customize the speed for each assist level to meet the needs of different riders. Taking level 1 as an example, the assist ratio range is "45-55%", and the default value for level 1 is "50%", which is a customizable value. Use the **UP/DOWN** buttons to increase or decrease the value. Press the **MODE** button briefly to confirm and proceed to the next assist ratio setting. You can set up to 9 assist ratios. After completing the settings, press and hold the **MODE** button to confirm and return to the instrument setting selection interface. Please refer to Appendix 3 for more details.

Assistance Ratio Numerical Settings Interface

Current Limit Value Setting

CUR represents the current limit. The current limit can be set within the range of 7.0-22.0A. Use the **UP/DOWN** buttons to change the maximum current value of the controller. Press and hold the **MODE** button to confirm and return to the instrument setting selection interface. The default value is 15.0A.

Current Limit Value Setting Interface

Assist Sensor Setting

Assist Sensor Direction Setting

PAS represents the assist sensor. "run-F" indicates the forward direction, and "run-b" indicates the reverse direction. Use the **UP/DOWN** buttons to toggle between the options. Press the **MODE** button to confirm and enter the assist sensor sensitivity setting. The default value is set to forward.

Assist Sensor Direction Setting Interface

Assist Sensor Sensitivity Setting

The screen displays "SCN," which represents the sensitivity of the assist sensor. The setting range is from 2 to 9, where 2 indicates the highest sensitivity and 9 indicates the lowest sensitivity. Use the **UP/DOWN** buttons to increase or decrease the sensitivity. Press the **MODE** button to confirm and enter the assist sensor ratio parameter setting interface. The default value is set to 2.

Assist Sensor Sensitivity Setting Interface

Assist Disc Magnet Number Setting

n represents the number of magnets on the assist disc. Use the **UP/DOWN** buttons to select the desired number of magnets. The default number of magnets is 6.

Assist Disc Magnet Number Setting Interface

Speed Sensor Setting

SPS represents the speed sensor, which can be adjusted based on the number of magnets installed on the electric bicycle wheel. The setting range is from 1 to 9. Use the **UP/DOWN** buttons for short presses to make changes. Press and hold the **MODE** button to confirm and return to the instrument setting menu. The default value is 1.

Speed Sensor Magnet Selection Interface

Gearshift Function Setting

Gearshift Power Assist Walking Enable Setting

Hnd represents gearshift, HL represents gearshift power assist walking, HL-N represents gearshift without power assist walking function, HL-Y represents gearshift with power assist walking function. When the gearshift is rotated, the instrument enters power assist walking mode. Y/N can be toggled through the **UP/DOWN** buttons, and confirmed by short pressing the **MODE** button. If N is selected, the gearshift gear enable setting interface will be entered; otherwise, return to the instrument setting item selection interface. The default value of the instrument is N.

Gearshift Power Assist Walking Setting Interface

Gearshift Gear Enable Setting

HF-Y represents gearshift with multiple gears, HF-N represents gearshift without multiple gears. If gearshift with multiple gears is selected, it means that when the gearshift is rotated, the maximum speed can only reach the corresponding speed displayed on the instrument for each gear. If gearshift without multiple gears is selected, it means that when the gearshift is rotated, it is not limited by the gear displayed on the instrument and can reach the rated maximum speed. Y/N can be set using the **UP/DOWN** buttons, and confirmed by short pressing the **MODE** button to return to the Gearshift Power Assist Walking Enable Setting Interface. Long pressing the **MODE** button confirms and returns to the instrument setting item selection interface. The default value of the instrument is N.
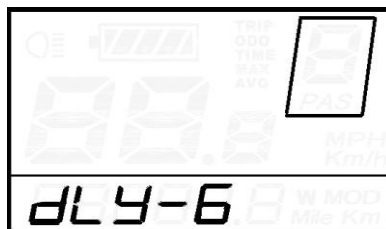
Gearshift Gear Enable Setting Interface

System Settings

Battery Delay Time Setting

dLY represents the battery delay time. Use the **UP/DOWN** buttons to select the battery delay time of 3/6/12 seconds. Press the **MODE** button to confirm and enter the maximum speed setting interface. The default value is 3 seconds.

Battery Delay Time Selection Interface

Maximum Speed Setting

LS represents the maximum speed. Use the **UP/DOWN** buttons to set the maximum speed within the range of 25-40 km/h. Press the **MODE** button to confirm and enter the button power assist walking enable setting interface. The default value is 40 km/h.
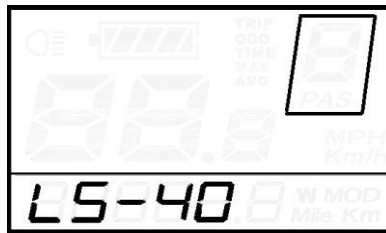
Maximum Speed Limit Setting Interface

■ **This setting parameter is the maximum limit value specified by the instrument manufacturer.**

Button Power Assist Walking Enable Setting

PUS represents button power assist walking. Use the **UP/DOWN** buttons to switch between Y (enabled) and N (disabled). Press the **MODE** button to confirm and enter the power assist walking speed setting. The default value of the instrument is Y.
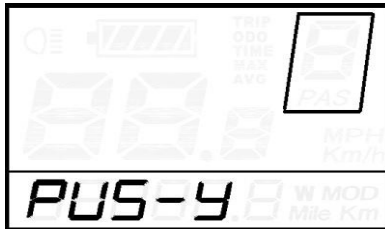
Button Power Assist Walking Enable Setting Interface

Power Assist Walking Speed Setting

By adjusting the power assist walking value, you can adjust the speed of walking assistance to meet the needs of different riders. Use the **UP/DOWN** buttons to select within the adjustable range of "20%-35%". Press the **MODE** button to confirm and enter the soft start setting interface. The default value is 25%.

Power Assist Walking Speed Setting Interface

Soft Start Setting

SSP represents soft start, with an adjustable range from 1 to 4, where 4 represents the slowest soft start. Use the **UP/DOWN** buttons to select, and long press the **MODE** button to confirm and exit the setting. The default value is 1.

Soft Start Setting Interface

◆**Power-on Password Setting**

Short press the **MODE** button to enter the password setting mode. The screen displays "P2," indicating the power-on password. Short press the **MODE** button to shift digits, and use the **UP/DOWN** buttons to increase/decrease the input value. After entering the 4-digit password, short press the **MODE** button to confirm. If the password is correct, it will enter the power-on

password enable setting interface; otherwise, it will remain in the password input mode. The default power-on password is 1212.
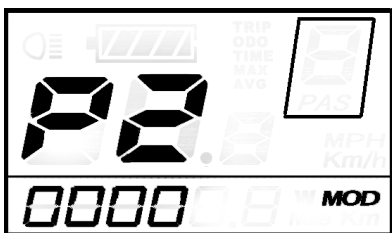
Power-on Password Input Setting Interface

Power-on Password Enable

Use the **UP/DOWN** buttons to select Y/N, where Y indicates that a power-on password is required, and N indicates that no power-on password is required. Press the **MODE** button to confirm. If Y is selected, press the **MODE** button to enter the password modification mode. Otherwise, exit the password setting and return to the instrument setting item selection interface. The default value of the instrument is N.

Password Enable Confirmation Interface

Power-on Password Modification

The instrument displays P3. Short press the **MODE** button to shift digits, and use the **UP/DOWN** buttons to increase/decrease the input value. After making the desired modifications, long press the **MODE** button to save and confirm, and exit the setting interface. Upon restarting the instrument, it will display P1 and 0000. Only after entering the correct password can the instrument function properly.

Password Modification Interface
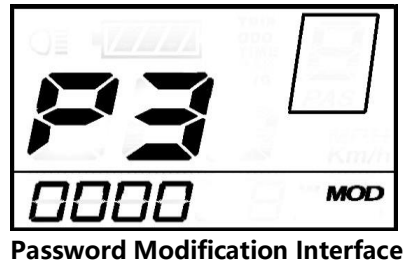
Exit Settings

In the setting state, short press the **MODE** button (within 2 seconds) to confirm and save the current settings. Long press the **MODE** button (more than 2 seconds) to confirm, save the current settings, and exit the setting state. Long press the **DOWN** button (more than 2 seconds) to cancel the current operation and exit the setting without saving the current settings data.

■ If no operation is performed within one minute, the instrument will automatically exit the setting state.

Restore Default Settings

dEF represents restoring default parameters. While in the normal display interface, simultaneously press and hold the **UP + MODE** buttons for more than 2 seconds to enter the restore default parameters interface. Use the **UP/DOWN** buttons to toggle between Y/N, where Y indicates the need to restore default parameters, and N indicates no need to restore default parameters. If Y is selected, long press the **MODE** button for more than 2 seconds to confirm. The instrument will automatically begin restoring default settings and display dEF-00. After the restoration is complete, it will automatically exit and return to the normal display interface.

Restore Default Settings Interface

Quality Commitment and Warranty Coverage

Warranty Information:

1. Any malfunction caused by the product's own quality issues under normal use will be covered by our limited warranty during the warranty period.
2. The warranty period for the product is 24 months from the date of instrument's factory shipment.

The following situations are not covered by the warranty:

1. Opening of the casing.
2. Damage to the connectors.
3. Scratches or damage to the casing after the instrument has left the factory.
4. Scratches or breakage of the lead-out wires.
5. Malfunctions or damages caused by irresistible factors (such as fire, earthquake, etc.) or natural disasters (such as lightning).
6. Product warranty period has expired.

Lead Connection Diagram

Standard Connector Wiring Order

Connection End with Contro   **Instrument Output End**   **Matching Cable End**

Table: Standard Connector Wiring Order

Standard Wiring Order	Standard Wire Colors	Function
1	Red(VCC)	LCD Power Wire
2	Blue(K)	Controller Power Control Wire
3	Black(GND)	LCD ground Wire
4	Green(RX)	LCD Data Receive Wire
5	Yellow(TX)	LCD Data Transmit Wire

■ **Some products use waterproof connectors for their lead wires, making it impossible for users to see the wire colors inside the harness.**

Precautions:

- Use the instrument with safety precautions and avoid plugging or unplugging it while it is powered on.
- Handle the instrument with care to avoid any impacts or collisions.
- Do not make unauthorized changes to the background parameters of the instrument, as this may affect normal riding functionality.
- If the instrument fails to function properly, please send it for repair as soon as possible.

Appendix 1: Error Code Definitions Table

Error Codes	Definitions
21	Abnormal Current
22	Turning handle throttle abnormal
23	Motor phase loss
24	Motor Hall sensor signal abnormality
25	Brake malfunction
30	Communication failure

Appendix 2: Personalization Settings Correspondence Table

No.	Setting item	Screen Display
1	Battery level setting	UOe
2	Assist parameter setting	SEA
3	Current limit value setting	CUr
4	Assist sensor setting	PAs
5	Speed sensor settings	SPs
6	Turner function setting	Hnd
7	System Settings	SYs
8	Power-on password setting	PSd

Appendix 3: Default Values Table for Power Assistance Gear Ratios

Gear selection \ Gear	1	2	3	4	5	6	7	8	9
0-3/1-3	50%	74%	92%	—	—	—	—	—	—
0-5/ 1-5	50%	61%	73%	85%	96%	—	—	—	—
0-7/ 1-7	40%	50%	60%	70%	80%	90%	96%	—	—
0-9/ 1-9	25%	34%	43%	52%	61%	70%	79%	88%	96%

Appendix 4: Quick Reference Table for Symbol Definitions

No.	Symbols	Meaning
1	*tC*	Single mileage clearing
2	*bL*	Backlighting
3	*U*	Unit
4	*UOL*	Voltage
5	*Ld*	Wheel diameter
6	*LS*	Speed limit
7	*cur*	Restricted flow
8	*run-b*	Reverse
9	*run-F*	Positive
10	*SCn*	Helping Sensitivity
11	*SPS*	Speed sensors
12	*dLY*	Power delay
13	*HC*	Steering assistance activation
14	*HF*	Gear shifting
15	*PUS*	Button-assisted propulsion
16	*SSP*	Soft start
17	*PSd*	Password
18	*dEF*	Restore default
19	*Y*	YES
20	*n*	NO